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Some Difficulties in Lasage-Thomson Gravitation Theory. Abstract Proceedings Amer. Assoc. Adv. Sc., Vol. XLI., 1892.

A Mathematical Review of the Free-will Question. Phil. Review, Vol. I., March, 1892.

Review of Mathematical Recreations, by W. W. Rouse Ball. Bulletin N. Y. Math. Soc., November 1, 1892.

Estimates of Distance. Science, March 11, 1892.

Oliver, Wait, and Jones. Text-books on Mathematics for Colleges. Algebra, especially chapter on Imaginaries, etc. Trigonometry.

Cornell University. Reports on Courses, Aims, and Methods of Mathematical Teaching at Cornell University.

Papers and Discussions at various Educational Meetings on Teaching, with application to the study and teaching of Mathematics.

The above sketch refers to matters which, being related to his scientific career, present themselves more easily to our notice.

But this was only a part of his life. Professor Oliver was interested in much outside of his special duties as teacher of mathematics. His moral qualities were of a superior order. His personal relations with his friends and colleagues were such as to gain for him their respect and affection.

But I feel that any attempt on my part to portray the social and moral side of his life would be inadequate, and must refer for information in this regard to the affectionate notices* of him written by those who had enjoyed the privilege of intimate companionship with him, and who regarded him as a man of exceptionally exalted character.

1895.

G. HAY.

FOREIGN HONORARY MEMBERS.

VISCOUNT FERDINAND DE LESSEPS.

IN the biographical notice that follows we do not expect to make an adequate exhibit of the work and honors of a life so long and impetuous as that of M. de Lesseps, but hope, by presenting the salient points in his career, to indicate what manner of man he was, from first to last, without intruding mere opinion.

Of his boyhood we know very little, except that he had every advantage of refined social life and education. As he reached manhood he found himself down at the front where volunteers for the

* See Christian Register, May 2, 1895; Cornell Daily Sun, April 3, 1895; The New Unity, Chicago, August 1, 1895.

advance were called, and he went forward. Fortune was inconstant, but he never looked back. For more than a half century he was the most conspicuous and interesting figure in the rush of the busy world; — he turned its tide, but it overtook him and whelmed over him when his footsteps faltered in old age. He was the hero of one generation, and the victim of another.

He was born at Versailles in the year 1805, and educated at the Lycée Napoléon for the foreign service, to which the family had a sort of traditional claim. His grandfather, Martin de Lesseps, was Consul at St. Petersburg before the Revolution, and his father, Matthew de Lesseps, held the Commissariat-Generalship of Egypt at the time that Ferdinand was born. Subsequently he was Imperial Commissary at the Seven Islands (Ionian), where he won the good will of everybody, and in the fantastic diction of the period he was declared to be "liberal even to fanatical generosity." In 1817 he was sent on a mission to Morocco, and shortly after appears as French Consul at Philadelphia, where he assisted at a Commercial Convention, and was elected a member of the American Philosophical Society. He married Mademoiselle de Grivegnir, daughter of a distinguished jurist in Malaga. It was through this Spanish mother that Ferdinand de Lesseps came to be a kinsman of the Empress of the French, in the unfolding plot of this family's missions.

The first professional employment for Ferdinand was offered by his uncle, Jean Baptiste de Lesseps (best known to scientific men as that Viscount de Lesseps who, in 1787, crossed Siberia from the Okhotsk Sea to bring a report — which proved to be the last tidings — from *La Pérouse*). This uncle in 1825 was French Consul at Lisbon, and Ferdinand, then twenty years old, was sent by him on a diplomatic errand. Shortly after this we find him a "student consul" at Alexandria, under his father, Matthew de Lesseps.

In 1833 he was given a sub-consulate at Cairo. It was in the following year that the great plague broke out, memorable as perhaps the most fatal visitation of modern times. Young Lesseps was then left in management of the Consul-Generalship, and he won such golden opinion that he was decorated with the cross of the Legion of Honor. In 1838 he went as Consul to Rotterdam, in 1839 to Malaga. It was as French Consul at Barcelona that he won, during the revolt of 1842, the admiration of Europe as a humanitarian. His personal courage and his devotion to suffering people induced four governments to send him decorations. He was made an officer of the Legion of Honor. The city of Marseilles awarded him a medal, and the city of Barcelona

caused his bust to be set up. A few years later he received the insignia of Chevalier of the Grand Cross of Isabella the Catholic.

In 1848 he was summoned to Paris by Lamartine, and sent as Minister Plenipotentiary to Madrid. After about one year he was withdrawn by Prince Napoleon, and sent in the same capacity to Rome, at the time of Garibaldi's occupation, — "a man," said M. Odilon Barrot, "who enjoys our full confidence, whom we have put to the test in very trying circumstances, and who has always served the cause of liberty and humanity."

M. de Lesseps has told the vexations of his Roman mission very interestingly in his "Recollections," but with singular absence of personal consciousness even in failure. He often defends himself, and designs to do so; but it is always an argument for the merit of the work upon which he is engaged, rather than any declaration of his own higher motives, except that he attributed all his successes to the energy of "patriotism," — a word which seemed to embrace about all the world. He seems to have used this word simply as the most modest admissible expression for public duty, and the obligation to serve in the great march.

He learned in the foreign service to respect and sympathize with earnest people everywhere, and formed enthusiastic friendships among even those of radically different blood and radically different traditions. To bring people together in some common interest and intent seemed to him to be the cure for national prejudice, and he saw in foreign trade this catholicon. In the administration of foreign affairs during periods mostly peaceful, he acquired a pretty clear impression of those larger principles of reciprocal trade that escape the merchant's more short-sighted view. The consulates were for him not only schools of commercial jurisprudence, but they enabled him to distinguish the interest of the community from that of the individual. An obstruction or difficulty in the path of trade may be of value to the few who know or can afford the roundabout way; but it is the mission of public spirit to equalize opportunities as well as to shorten process. M. de Lesseps, in his letter to Cobden (1854), advised those statesmen who opposed the Suez Canal because it would reduce the number of ships and men by shortening the route to India, to induce shipmasters to take the Cape Horn route, and thus employ more men and more ships. This retort is a pretty good illustration of his way of meeting disingenuous criticism by the *reductio ad absurdum*.

In this earlier part of his life, following in the footprints of his fathers, he often missed complete success, — although always in

earnest. But all the while he was unwittingly fitting himself for his true mission, and gaining strength, and knowledge, and courage for a practical interpretation of a sublime thought: "*Je veux détruire cette muraille de sable qui arrête le progrès.*"

This *muraille de sable*, this wall of sand, separates two worlds. In one, man plays the roll assigned to him in the original setting of the piece; in the other, he assists in never-ending creation. In one he awaits his orders in harness, in the other he is charioteer. But from whichever point of view we look backwards across the Isthmus, from Islam or from Christendom, history foreshadows the canal. And now that it is finished and in full operation, so that its direct effects upon the commerce of the world have ultimated, one reads the history of trade by a new light, which discovers prophetic meaning in many events that anticipated this new dispensation.

If we seek the origin of the idea, we are taken back to a remote past; and we may follow the thought down through a hundred generations, which it dimly pervades, till the sifting of the French Revolution discovers its "fixity, that true sign of the law"; thenceforth, it is a pressing obligation hastening to maturity.

In Napoleon's message to the Directory, "Whatever European power holds Egypt permanently is in the end mistress of India," he put the cart before the horse, as we have since learned; but the necessity for the canal in the scheme of human progress is reflected even in such inverted conceptions, and to the short-lived Egyptian Institute we owe the first scientific investigation of the problem of joining the two seas, although the errors of survey, which deferred the project by placing the two seas out of level, reflect little credit upon the pupils of the Normal School. To make errors that should prove stepping stones to the truth was, however, in the spirit of the age; and the report of Lapère — reasserting "*the wisdom of the ancients,*" that had already afflicted and separated the nations of the earth for thirty-five hundred years — only aroused a new and defiant generation, that with better observations and in better temper reconciled the two seas forever.

M. Mimut, "one of the most distinguished diplomats ever in the service of France," holding the great work of the French expedition in his hands, gave to M. de Lesseps the first quickening thought, and from that moment his mind and heart received the ancient hope renewed, and he became its champion. It was a religious experience. "You have," said Renan, addressing him at the Academy, "caused to blossom once more a flower which seemed faded forever. You

have given to this sceptical age of ours a striking proof of the efficacy of faith."

We are satisfied that here is the point of view from which the confidence and the enthusiasm of M. de Lesseps is comprehensible. How could he possibly have expected to convert such a man as Lord Palmerston? The result of their interview was that M. de Lesseps doubted the sanity of the Premier, while the latter regarded him as an adventurer, — a soldier of fortune, — employed, perhaps, in the interest of some French "move" in Egypt. In reality, there stood before the great statesman a simple-minded Da Gama, who had discovered a new route to India and offered himself as the pilot. It was nobody's interest then to make him a figure-head, — he was at the other end of the ship; it was his trick at the wheel.

After the failure of the Egyptian expedition, Napoleon, in 1803, instructed Matthew de Lesseps, Political Agent in Egypt, to nominate for election and for the Sultan's approval an officer of ability to serve as Pasha of Cairo. M. de Lesseps named one who was then in command of a regiment of Basha Bazouks, a Macedonian, who could neither read nor write, and who had come to Egypt as a subordinate of contingents. This man was Mehemet Ali, — the wise and terrible, — who subsequently made himself master and mortgagee of Egypt. It was he who built the Mahmoudieh Canal, — the last, and perhaps the greatest, of non-militant works ever executed by unaided human hands. He also inaugurated work on the Barage — the dream of Hassan — over which Egypt had brooded five hundred years; and it was he that discovered the potential energies of young Lesseps, whom he caused to sit at his feet and listen to the narrative of his slaughter of the Mamelukes, and the now possible project of a cut through to Suez, which the Viceroy was ready to undertake, under a *grand corvée*, except that he feared the would-be and could-be mistresses of India.

It was at this time (while consular pupil in 1832) that Ferdinand de Lesseps became the companion, and incidentally the teacher, of Saïd Pasha, the son of the Viceroy, on whom was laid the futuration of the father's dream, — and the dream of all the Pharaohs. The "memorandum" prepared for this prince by M. de Lesseps, long after, connects itself in our minds with these boyhood days, when he says, "The names of the Egyptian sovereigns who erected the Pyramids remain unknown, — the name of the prince who opens the great maritime canal will be blessed from century to century down to the most distant posterity," — so well did this "grand Frenchman" understand and share the hope of glory upon which he counted.

Ever since the establishment of British power in India, the best minds in England had seen the necessity of securing a right of way across the Delta of the Nile, and a step in this direction seemed to be made in the treaty of Warren Hastings in 1776; but nothing came of it till the vigorous movement of Mehemet Ali to open a transit route via the Mahmoudieh Canal brought Waghorn to the front in 1829, — the Indian mail service really opened two years later, — although it was not till 1840 that a steamship company used the Red Sea route. Young M. de Lesseps was witness of Waghorn's triumph, and, more than all the world besides, did him the honor of a just appreciation. He was an example and an inspiration all his life, and when his own hour of triumph arrived he raised a statue to Waghorn at Suez.

Professional detractors discover, now, that the Suez Canal never really presented any physical difficulties or dangers; but how many of this class resisted the heresies of the French expedition, or forsook them at the bidding of a Bourdelau? Many of us are old enough to remember when in popular belief the two seas were out of level, the sand storms of the desert buried caravans and armies, and thousands of dead fellaheen were used each month to raise the banks of the Mahmoudieh Canal. Children in our Sabbath schools were taught these things of the land of Mehemet Ali, — that bold bad Napoleon of Islam. And yet the *Revue des Deux Mondes*, away back in 1835, ventured to say, "Mehemet Ali is working for Europe, which will become his heir."

None of these bugbears troubled the mind of M. de Lesseps, who was the first to declare that the Isthmus was only a *muraille de sable qui arrête le progrès*. This was not the "bluff" of the speculator, but the faith that moves mountains. Yet, as late as July, 1852, in a letter to the Consul General of Holland in Egypt, he says, "I confess that my scheme is still in the clouds, and I do not conceal from myself that, as long as I am the only person who believes it to be possible, that is tantamount to saying it is impossible." At this time he had forsaken Egypt and was setting up a model farm in the Berry district and restoring the castle of Agnes Sorel. Abbas Pasha was then Viceroy of Egypt, and this prince knew not Joseph. It was under this Viceroy that the English Transit Railway was built.

In 1854, when M. de Lesseps was nearly fifty years old, Abbas Pasha died, and the "sympathetic Mohammed Saïd" became Viceroy of Egypt, and immediately sent for his old master to return; and before the close of the year, the concession of powers for the formation of the canal company had been issued.

A few little touches of nature in the journal of Lesseps, at this critical turning point of his career, reveal the entire consecration of every faculty to the great mission of his life. As he left his tent in the early morning of that anxious day, when the Viceroy was to hear his story and decide upon building the canal, he beheld a rainbow in the sky: "I confess that my heart beat violently, and that I was obliged to put a rein upon my imagination, which was tempted to see, in this sign of alliance spoken of in the Scriptures, the presage of the union between the Western and the Eastern world, and the dawning of the day for the success of my project." And again, on the same day, "When I leave the Viceroy to go and get my breakfast, I jump my horse over the parapet. You will see that this foolhardy act was one of the reasons that induced the Viceroy's *entourage* to support my scheme, — the generals at breakfast telling me as much." On the same day there was target practice, and a whole regiment had failed to hit the mark. M. de Lesseps seized a musket and put a bullet through the bull's-eye. Again, as he stood there, a bird hovered in the sky, — he raised his piece and fired, — an eagle fell at his feet. Even misfortune betokened success, as when on the Nile his cabin took fire and he was severely burned, he said, "The accident was of good omen, in that we had acquitted our debt to ill luck." Later, he found himself accidentally a lodger in the building which had once held the Institute of Egypt, and "this too was a good sign." All signs point our way when we are on the right road.

The gods were propitious, the prince was gracious. M. de Lesseps did not pause to consider whether these gods were of his own creation, or this prince only his docile pupil. Besides, he was not alone to carry the burden of this project, even in its initial stage. He had taken two friends into his counsels long ago. These were Linant Bey and Mougel Bey, engineers of the Barage and countrymen of his. These three put their earnings together, and with a capital of six thousand dollars they formed the nucleus of the "Compagnie Universelle."

Linant Bey had long before tried to raise a company to build the canal, and he and Bourdelau had run double lines of levels reconciling the two seas. He had also traced a line of location, which was very nearly that adopted in exploitation. Mougel, well known since as the chief engineer of the Barage, was recognized as the essential third point of support. In his journal of this initiatory period, M. de Lesseps notes down his dependence upon the knowledge, skill, and devotion of these two friends; and in his days of greatest glory he published

these notes, that all the world might be just to those who ventured with him in the forlorn hope.

These three kindred spirits, with only the Bible for their guide-book, made a reconnaissance of this route. The journal of Lesseps, which contains over twenty quotations from the Old Testament, is full of the confidence and courage of hope and health. In that desert land the skies are clear and the north wind full of joyous life and stored up energies. The whole horizon is in view, and he who has singleness of purpose may march straight to his destiny, whether he holds the Koran or the Bible. And here we are minded of that fearful contrast offered by the Isthmus of Panama on the other side of the earth, — with its weary mountains and dark forests breaking down the trade winds, and shortening and degrading the vision till high hopes and purposes are starved out, and man becomes a timid, sickly animal.

We agree that, as it turned out, the Suez Canal did not involve the solution of any new problems of physics, or very greatly tax the skill of French engineers. Indeed, it was not the practical and direct difficulties that really made the nations timid. In “this wall of sand,” separating the Moslem from the Christian world, there lay sealed up with the seal of Solomon afreet and genii that made nations tremble to think of; for these, rashly let loose, might disturb the balance of power and throw out of adjustment trade and industries all over the world. It proposed radical change, and who could tell what might happen? Engineers and laborers stood ever ready to do the work, but the world waited for the prophet who could forecast a healthy and happy result. M. de Lesseps filled this office. His training, his knowledge, and his enthusiasm commanded respect. His promises of advantage east and west once seemed florid beyond the measure of his careful computations and great array of statistics, but, as we read his articles now, we are struck with his acuteness of foresight and his moderation.

He seems to have been a man of unusual singleness of purpose, — in something wider than a moral sense, — and to have absorbed himself absolutely in the work before him without ulterior design. He was in politics a republican, but he “never even from curiosity attended a political meeting.” He was a partisan of the Prince President, but he could not follow him in the *coup d'état*, and only submitted to the Empire in the interest of peace, — and the canal. The Empress was a kinsman of his, and he had rendered her, in her humbler life, a personal service which she requited in personal good will. These relations may have procured for him the *entrée* to the

family circle, and brought the Emperor within the sphere of good influence. French journals were quick to discover an epigram, — the expression of good omen: "The marriage of two families, and the marriage of two seas." And this ran through the newspapers all around the world: "There is an Arab proverb (much affected by M. de Lesseps) quite apposite here: 'The dogs bark, — the caravan passes.'"

M. de Lesseps was not, by early training, an engineer, but a diplomat. To us his real assimilated rank is that of a discoverer. Why not, as well as Da Gama and Magellan? These declared that a ship could reach the Pacific Ocean by sailing *around* the continents, and they proved it. De Lesseps declared that a ship could reach the Pacific Ocean by sailing *through* the continents, — and he proved it. "He discovers who proves," said Aristotle. None of these men originated a new thought, but each of them did a new thing for the relief of mankind. Vasco de Gama was a prize drawn in a lottery in answer to prayer. He received his instructions through a great prince; and the miracle of his selection and vicarious appointment raised him above all fear. M. de Lesseps presents the antithesis. He was a volunteer who taught princes a good doctrine, and held them down to it. "Hear me for my cause" was all he asked, and those who paused to listen fell under the spell of his enthusiasm and received his testimony.

That was a period of great strain, when Robert Stephenson, one of his own professional caste, turned upon him in Parliament and spoke of his project as "one of those chimeras so often formed to induce English capitalists to part with their money, the end being that these schemes leave them poorer, though they make others much richer." The good temper and even the good sense of M. de Lesseps gave way, and he crossed the Channel to demand explanation. The explanation was made, and we are constrained to say that, if M. de Lesseps had not long afterwards, in his old age, published the correspondence, we should have overrated these contending champions of land and sea.

We can appreciate the causes for anxiety that afflicted intelligent men of affairs in Great Britain. Any change in the course of trade involves national risk. In this way the Venetian Indian trade had dwindled away after the Cape route was opened; then arose Portugal and Holland, to be outdone by England only after a tremendous struggle. Who could say which way the wheel might turn if the Egyptian Transit Railroad came to be supplanted?

England hardly attempted to disguise her apprehensions of danger

to her trade from the success of the canal built by a rival nation ; but when she prevailed upon the Sultan to order the withdrawal of the fellah labor, our American journals charged her with complacent hypocrisy, and very naturally, since she had just completed the Transit Railway under the *corvée* in its most cruel form. Under this *corvée*, Egypt had always draughted men for public works, much in the same way that other countries procure soldiers in time of war. In a country whose existence is involved in a system of canals of irrigation and dikes, there must be no hesitation at critical moments.

M. de Lesseps had prevailed upon Mohammed Saïd greatly to modify the *corvée* so far as to provide wages and hospitals, but the Viceroy insisted that the abolition of the system would ruin Egypt. Inducing the peasant to work for government by offers of reward was an untried experiment, and one too dangerous to try, since its failure involved, as alternative, the calling in of foreign labor, — an abomination to the Egyptian. England's suggestion that, to avoid the foreign force, the dimensions of the canal should be reduced to the capacity of the native labor, was perfectly logical, and consistent with her alarm policy. But England's policy, like our own, is the net result of conflict among varied interests, theories, and sentiments. The Transit Railway had been practically a national interest, and in the *composition of forces* this interest had been strong enough to determine the direction of the *resultant* till the work was finished. But reports from the scene gradually aroused the humanitarians, who threw their weight into the scale where the interests of the fellahs seemed to lie. In this way, Lord Palmerston, wholly misunderstanding the signs of the times (as events proved), worked more wisely than he knew, and the spell that had darkened Egypt from her birth broke forever.

M. de Lesseps — always single in his purpose — made the withdrawal of the *corvée* another stepping stone to success. He procured the reference of the question of damages to the Emperor of the French, who made a generous decision in his favor, — far too generous, perhaps, but it enabled the company to introduce machinery in place of hand labor, till the Suez plant excelled that in use in any other part of the world.

The writer of this notice, who made an inspection under full authority from M. de Lesseps the year before the canal was opened, can bear witness that never before or since, in his long experience, has he seen laborers so kindly cared for and so free under the most absolute discipline. M. de Lesseps said, "I have no difficulty in controlling my laborers, because I treat them kindly and make them comprehend

that they are working for all mankind." His labor then was drawn from many races, but did not include the "sambos," "bravos," coolies, and mongrels of Panama.

His sympathies were always with the fellaheen, even to his own prejudice. He had lived among them, they had served him, and when the struggle came for the possession of the canal he did not ask that it should be French, but that it should be neutral under a pledge from Araby Pasha, the chief of revolting fellaheen and Arab troops. One can hardly conceive of a professional diplomat so blind to his own interests and the interests of the *Compagnie Universelle*, but, like his grandfather of the Seven Islands, "he was generous even to fanaticism."

It must not be overlooked that the Suez Canal is an extension of the Mediterranean and an improvement upon the old route of trade between Europe and Asia, along which ports have been made, warehouses established, and political relations adjusted. Its opening was an easement to all the world. Its construction was sure, because it was the next legitimate step forward under the pressure of an enormous demand. It was, as it proved, no experiment. The ground had been profiled and bored, the climate had been tested and found healthy and cheerful; and laborers were near at hand, not likely to suffer in temper and spirits from the slight change of scene. In short, there were no difficulties, except familiar vicissitudes — and the pride of kings.

The successful opening of the Suez Canal, near the close of 1869, induced throughout the world, perhaps for the first time, a conviction of common interest. The struggle in Egypt had been with the common enemy, and the victory belongs to us all. It was the old allegory adapted to our age, with Count de Lesseps in the part of St. Michael. Among the Mohammedans, as among Christians, there are sects that believe in an internal sense of the word. To these, human life and history, and all events, both great and small, are allegories, and he who catches so much as a glimpse of the esoteric meaning of the piece plays his part like a god. This is the source of enthusiasm.

Some newspaper men are comparing the traffic of the Sault de Ste. Marie with that of the Suez Canal, — as if these two works were of the same world-wide interest, or of the same dramatic import. There may be more tonnage passing through the lock at the "Soo" than through the desert of Suez, and there may be more yet passing through a city street, but the gonfalon was borne by the *Compagnie Universelle*.

During the construction of the canal, we never heard of a single

American purchaser of a share. Yet these shares are worth now many times their original face value, and we, indirectly or through foreign ships, are among the best customers. The Report for last year shows that of the three thousand three hundred and fifty-two ships that passed through the canal (averaging considerably over two thousand tons each) England sent two thousand three hundred and eighty-six and the United States only five.

Since the days of the Conquistadors, the project for a canal through the American isthmus had been an alternative to the shorter route to the Indies by way of Suez, to be considered in case physical or political difficulties should intervene. The completion of the Suez Canal and the guaranty that British control gave it, reduced very much the commercial demand for the westward route. Nevertheless, the immense revenue at Suez excited the popular mind, especially in France, with the hope of a great speculation in the establishment of a rival company, which, while sharing in some measure the overflowing trade of India and China, might secure the interchanges between the two coasts of America, and perhaps the whole of our trade with Japan.

The Panama project was high born and burst into life a full grown scheme. There were no prime ministers, emperors, and sublime portes lying in wait to stifle it. With Count de Lesseps for its godfather holding the lamp of Aladdin, all the world attended its baptism with complacent expression, — except, perhaps, that the Monroe Doctrine cast a sinister shadow over the scene, — a very thin shadow, but enough to depress the market for the securities after the first rush was over. But what the scheme lacked from first to last was justification in immediate necessity. It had an illegitimate and premature birth, and its sponsors limited their risks to broker's charges, — except M. de Lesseps, who gave all. He gave his past earnings in the best service of our age, and he gave his fair fame as endowment enough for the whole credit of the company — at the start.

Professor Nourse and other clever writers have said that the American canal would be of greater benefit than the Egyptian, because it would connect greater oceans, and that commerce demands a navigable zone around the world.' Half in sympathy with these ideas, we cannot help thinking that in this aphoristic form they lack practical merit. Man does not inhabit the sea; and the road that traverses or connects intimately the most inhabited portions of the earth must be the most valuable. Our system of overland railways to the Pacific is practically a supplement to the Suez Canal in the all around commerce of the world, and it was the building of this system with its connec-

tions that for many years diverted our capital from the ocean, to which it reluctantly returns.

"Fear only the unforeseen" is a classic proverb, much affected by the French, but among no other people has it less practical honor. For the Panama project, the almost unprecedented depth of the cut, the peculiarly obdurate ledges, the great rainfall interrupting labor and causing sloughing of the banks, the necessity for turning the Chagres River, were difficulties weighed and discounted at the start, by able engineers and by a very large and very intelligent company in France. But the "bodily slipping of the hills," in the excavations near the summit level, was a frightful disappointment. It necessitated a postponement of the sea level cut, and the adoption of a scheme of locks, which involved the ponding of the Chagres River. This *change of base* was fatal, and the company broke. A new company has been formed and may keep the project alive till a stronger call from the commercial world comes to its aid.

The King of Spain, looking from his chamber window, shaded his eyes and said, "I am looking for the walls of Panama, — they have cost enough to be seen from here."

With regard to the charges of fraud against the financial management of the Panama Canal Company, we do not feel competent to speak, except to call attention to their diminution as investigations proceed. But with regard to the waste of plant, it does not seem in undue proportion to the magnitude of the experiment. Charges of waste were made against the Suez Canal Company, — especially by our journals and those of other distant people, — and they attend all great enterprises. The plant that does not prove equal to the new work must be cast aside, and lost, if far away from the junk market. The greatest and most successful works that we have visited are strewn with wreckage, marking the field where the battle was won.

Throughout the whole period of the construction in Egypt, M. de Lesseps was actual manager in chief. Many thousands worked under his direction, holding all gradations of rank, but he was the real master spirit. His reports from the beginning are full of acknowledgments of the services and merits of his subordinates. At the outset he leaned upon the superior engineering of Linant Bey and Mougel Bey, and for many years preceding the completion of the canal his reports place Voisin Bey in the foreground, not as a shield from responsibility, but as the support of an enthusiastic company whose millions were thus insured. In his old age, the dependence upon others necessarily became greater and greater, and in the

Panama scheme he no longer verified the statements of the engineers by adequate inspection and exploitation, but absolutely fell back upon others. His old attitude of control and command continued, but he merely indorsed the reports of the chiefs of divisions, — *whose figures, we now know, were correct*, — without discovering their misleading limitations. His famous promise that the canal should be open to the passage of vessels in 1889 was based, as he stated, upon the unanimous acquiescence of his chiefs of division. Moreover, if we plot on profile paper the amount of work done from date to date, the curve of increments, projected, seems to justify the prediction. His own belief in it is enthusiastically stated in his “Recollections of Forty Years,” and he adds: “I am an octogenarian. Old age foresees, and youth acts.” This last *mot* was lost upon the public, who saw him now only as the figure-head of a brave ship given over to pirates.

In 1869, the year of the triumphal opening of the Suez Canal, M. de Lesseps was sixty-four years old. This is the age of compulsory retirement for our United States Engineers. But M. de Lesseps was so vigorous that he was for many years later a most valuable man in council. He aided the ship canal of Corinth, and the grand canal from the Elbe to the Baltic. It was not until he was seventy-six that the *Société du Canal de Panama* was constituted, and he was eighty when he crossed the ocean to make a personal inspection of the work in progress. The execution for a year or two, under the full contracts, seemed to realize his predictions, and warrant great expectations; but after that everything went wrong. The master's mind failed before he could have discovered how much he had been betrayed. He lived to be eighty-nine, and died a poor man. His widow and her children are now dependent upon a pension from the Suez Canal Company.

1896.

HENRY MITCHELL.

NOTE. — The foregoing had been written out for transmission to the Academy, but was withheld under misgivings as to the adequacy of our very much foreshortened view of the causes of the failure at Panama, until Mr. Nathan Appleton (American Agent of the Panama Canal Company) sent us the last word spoken on the subject by a *competent* witness. This was in the form of a biographical notice by M. Gabriel Gravier, which the Countess de Lesseps sent to Mr. Appleton with her autograph indorsement. This writer takes the ground that all was going well, till a senseless panic upset the market. “The work was marching to a certain success; the original

estimate had proved very nearly sufficient. Whence came the cyclone which swept away the company and its four hundred thousand shareholders? From Paris, the distracted brain of France!" With some personal and professional knowledge of the American isthmus, and from reading the recent reports of Kimball, Rogers, and others, we distinctly see that the difficulties in the Panama scheme were really intrinsic, — although not insurmountable, — and we have let our account stand.

The Academy has received an accession of ten Resident Fellows, six Associate Fellows, and ten Foreign Honorary Members.

The Roll of the Academy, corrected to date, includes the names of 196 Fellows, 96 Associate Fellows, and 73 Foreign Honorary Members.

MAY 13, 1896.